

08/28/98  
jc598 U.S. PTO

PTO/SB/05 (12/97)  
Approved for use through 09/30/00. OMB 0651-0038  
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE  
09/14/98  
08/28/98

Please type a plus sign (+) inside this box → ☐

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>UTILITY PATENT APPLICATION TRANSMITTAL</b>  (Only for new nonprovisional applications under 37 CFR 1.53(b))	Attorney Docket No.	P644	Total Pages	1
	First Named Inventor or Application Identifier			
	Mark A. Boys			
	Express Mail Label No.	EI061742752US		

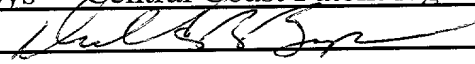
<b>APPLICATION ELEMENTS</b> See MPEP chapter 600 concerning utility patent application contents.	<b>ADDRESS TO:</b> Assistant Commissioner for Patents Box Patent Application Washington, DC 20231
<p>1. <input checked="" type="checkbox"/> Fee Transmittal Form (Submit an original, and a duplicate for fee processing)</p> <p>2. <input checked="" type="checkbox"/> Specification [Total Pages 18] (preferred arrangement set forth below)</p> <ul style="list-style-type: none"><li>- Descriptive title of the Invention</li><li>- Cross References to Related Applications</li><li>- Statement Regarding Fed sponsored R &amp; D</li><li>- Reference to Microfiche Appendix</li><li>- Background of the Invention</li><li>- Brief Summary of the Invention</li><li>- Brief Description of the Drawings (if filed)</li><li>- Detailed Description</li><li>- Claim(s)</li><li>- Abstract of the Disclosure</li></ul> <p>3. <input checked="" type="checkbox"/> Drawing(s) (35 USC 113) [Total Sheets 5]</p> <p>4. Oath or Declaration [Total Pages 2]</p> <p>a. <input checked="" type="checkbox"/> Newly executed (original or copy)</p> <p>b. <input type="checkbox"/> Copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional with Box 17 completed) [Note Box 5 below]</p> <p>i. <input type="checkbox"/> DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).</p> <p>5. <input type="checkbox"/> Incorporation By Reference (useable if Box 4b is checked) The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.</p> <p>6. <input type="checkbox"/> Microfiche Computer Program (Appendix)</p> <p>7. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)</p> <p>a. <input type="checkbox"/> Computer Readable Copy</p> <p>b. <input type="checkbox"/> Paper Copy (identical to computer copy)</p> <p>c. <input type="checkbox"/> Statement verifying identity of above copies</p>	
<b>ACCOMPANYING APPLICATION PARTS</b>	
<p>8. <input type="checkbox"/> Assignment Papers (cover sheet &amp; document(s))</p> <p>9. <input type="checkbox"/> 37 CFR 3.73(b) Statement (when there is an assignee) <input checked="" type="checkbox"/> Power of Attorney</p> <p>10. <input type="checkbox"/> English Translation Document (if applicable)</p> <p>11. <input type="checkbox"/> Information Disclosure Statement (IDS)/PTO-1449 <input type="checkbox"/> Copies of IDS Citations</p> <p>12. <input type="checkbox"/> Preliminary Amendment</p> <p>13. <input checked="" type="checkbox"/> Return Receipt Postcard (MPEP 503) (Should be specifically itemized)</p> <p>14. <input checked="" type="checkbox"/> Small Entity Statement filed in prior application, Status still proper and desired</p> <p>15. <input type="checkbox"/> Certified Copy of Priority Document(s) (if foreign priority is claimed)</p> <p>16. <input type="checkbox"/> Other: .....</p>	

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No: \_\_\_\_\_/\_\_\_\_\_

18. CORRESPONDENCE ADDRESS

☐ Customer Number or Bar Code Label (Insert Customer No. or Attach bar code label here) or ☐ Correspondence address below

NAME	Donald R. Boys - Central Coast Patent Agency				
	Signature- 				
ADDRESS	P.O. Box 187				
CITY	Aromas	STATE	CA.	ZIP CODE	95004
COUNTRY	United States	TELEPHONE	(408) 726-1457	FAX	(408) 726-3475

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**FEE TRANSMITTAL**

Note: Effective October 1, 1997.  
Patent fees are subject to annual revision.

**TOTAL AMOUNT OF PAYMENT (\$)** 436.00**Complete if Known**

Application Number	NA
Filing Date	NA
First Named Inventor	Mark A. Boys
Group Art Unit	NA
Examiner Name	NA
Attorney Docket Number	P644

**METHOD OF PAYMENT (check one)**

1. ☐ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number   
Deposit Account Name

☐ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17 ☐ Charge the Issue Fee Set in 37 CFR 1.18 at the Mailing of the Notice of Allowance

2. ☒ Payment Enclosed:  
☒ Check ☐ Money Order ☐ Other

**FEE CALCULATION****1. FILING FEE**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
101 790	201 395	Utility filing fee	395.00
106 330	206 165	Design filing fee	
107 540	207 270	Plant filing fee	
108 790	208 395	Reissue filing fee	
114 150	214 75	Provisional filing fee	

**SUBTOTAL (1) (\$)** 395.00**2. CLAIMS**

Total Claims	Extra	Fee from below	Fee Paid
16	-20 = 0	11	0
4	-3 = 1	41	41.00
Multiple Dependent Claims			

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
103 22	203 11	Claims in excess of 20
102 82	202 41	Independent claims in excess of 3
104 270	204 135	Multiple dependent claim
109 82	209 41	Reissue independent claims over original patent
110 22	210 11	Reissue claims in excess of 20 and over original patent

**SUBTOTAL (2) (\$)** 41.00**FEE CALCULATION (continued)****3. ADDITIONAL FEES**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
105 130	205 65	Surcharge - late filing fee or oath	
127 50	227 25	Surcharge - late provisional filing fee or cover sheet	
139 130	139 130	Non-English specification	
147 2,520	147 2,520	For filing a request for reexamination	
112 920*	112 920*	Requesting publication of SIR prior to Examiner action	
113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action	
115 110	215 55	Extension for reply within first month	
116 400	216 200	Extension for reply within second month	
117 950	217 475	Extension for reply within third month	
118 1,510	218 755	Extension for reply within fourth month	
128 2,060	228 1,030	Extension for reply within fifth month	
119 310	219 155	Notice of Appeal	
120 310	220 155	Filing a brief in support of an appeal	
121 270	221 135	Request for oral hearing	
138 1,510	138 1,510	Petition to institute a public use proceeding	
140 110	240 55	Petition to revive - unavoidable	
141 1,320	241 660	Petition to revive - unintentional	
142 1,320	242 660	Utility issue fee (or reissue)	
143 450	243 225	Design issue fee	
144 670	244 335	Plant issue fee	
122 130	122 130	Petitions to the Commissioner	
123 50	123 50	Petitions related to provisional applications	
126 240	126 240	Submission of Information Disclosure Stmt	
581 40	581 40	Recording each patent assignment per property (times number of properties)	
146 790	246 395	Filing a submission after final rejection (37 CFR 1.129(a))	
149 790	249 395	For each additional invention to be examined (37 CFR 1.129(b))	

Other fee (specify) \_\_\_\_\_

Other fee (specify) \_\_\_\_\_

\* Reduced by Basic Filing Fee Paid

**SUBTOTAL (3) (\$)** 0.**SUBMITTED BY**

Typed or Printed Name

Donald R. Boys

Signature



Date

08/28/98

**Complete (if applicable)**

Reg. Number

35,074

Deposit Account User ID

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

# Rewind Radio and Television

*By Inventor Mark A. Boys*

5

## **Field of the Invention**

The present invention is in the area of radio and television apparatus,  
10 and pertains more particularly to methods and apparatus for recording and  
playing back radio and television presentations.

15

## **Background of the Invention**

Modern radios and entertainment centers typically include recording  
equipment. It is, for example, common for a home entertainment center to  
include a tape recording apparatus wherein a user may select to record  
20 portions of an incoming audio broadcast and record to tape. Similarly, such  
entertainment centers typically include TV receiving, tuning and display  
apparatus whereby one may tune to video signals, such as regular TV  
broadcasts. In the area of TV and other displayable video, it is common for  
such centers to include video cassette recording (VCR) apparatus whereby  
25 one may select to record portions of tuned video signals, so the video  
display may be reproduced at a later time for whatever purpose. Outside the  
home environment it is also common for radios, such as automobile radios,  
to include a magnetic tape player, allowing a user to elect to play a tape  
rather than a tuned-in radio presentation. Car radios, however, typically do  
30 not include recording apparatus, nor any facility for a user to record on the

tape apparatus portions of the tuned radio channel that may be playing at any point in time.

Even with the existence and use of the prior art apparatus described above there is an unmet need. It often happens, for example, that a person is  
5 taken a bit by surprise by a desire to record a portion of a video or audio presentation. What usually happens is that the person watching a TV presentation or listening to a radio broadcast realizes too late that he or she would like to have a recording of all or part of what has just been presented. Of course, in some cases, the presentation may be available for purchase  
10 from the broadcaster, but this is usually not the case.

What is clearly needed is a means of automatically recording an incoming data stream in a circular manner, meaning that after a fixed time period of sequential recording, the recording apparatus will continue to record by overwriting the already recorded material in the same order as  
15 originally recorded, the oldest data being overwritten first. The net effect will be, at any moment in time, while the apparatus is recording, a recorded body of matter representing a time period prior to the present moment equal to the recorded time period represented by the magnitude of the memory apparatus being used.

In embodiments of this invention a presentation device, such as a radio or TV apparatus, will always have a recorded version of the last "x" minutes or hours of the presentation, so a user always has access to material he or she may at any moment desire to review or reproduce. The magnitude of "x" is alterable by the magnitude of the recording apparatus, and may  
25 vary from seconds to many hours in different embodiments.

### **Summary of the Invention**

In a preferred embodiment of the present invention a radio apparatus  
5 is provided comprising tuning circuitry for selecting a channel from an input  
rf spectrum; an output for driving a speaker system with an audio  
presentation derived from the selected channel; and a recording apparatus  
having a memory with capacity for recording a fixed time duration T of the  
audio presentation, and adapted to make an audio record sequentially in a  
10 circular fashion, such that when the memory capacity is filled, the device  
continues to record, overwriting the oldest recorded information, providing  
thereby, at any point in time, a stored copy of time duration T immediately  
preceding the point in time. In various embodiments the recording apparatus  
may comprise a tape recorder or a digital memory.

15 In preferred embodiments there are user-operable inputs for  
interrupting circular recording, selecting beginning positions for playback,  
and playing back the recorded data. OEM and Add-On devices are both  
taught in the descriptions below.

In an alternative aspect of the invention a television apparatus is  
20 provided comprising tuning circuitry for selecting a channel from an input  
video spectrum;

an output for driving a television display with a video presentation  
derived from the selected channel; and a recording apparatus having a  
memory with capacity for recording a fixed time duration T of the video  
25 presentation, and adapted to make a video record sequentially in a circular  
fashion, such that when the memory capacity is filled, the apparatus  
continues to record, overwriting the oldest recorded information, providing

thereby, at any point in time, a stored copy of time duration T immediately preceding the point in time. The recording apparatus in one embodiment comprises a video tape recorder adapted to record in a circular fashion, and in another embodiment the memory is a digital memory managed to record sequentially in a circular fashion, and the video presentation is presented at the television display and simultaneously digitized as necessary and recorded in the digital memory. There are in this aspect as well, user-operable inputs for interrupting circular recording, selecting beginning positions for playback, and playing back the recorded data, and add-on devices are also provided.

In various embodiments of the invention, taught in enabling detail below, for the first time, a limited rewind capability is made available for real-time data streams.

#### **Brief Description of the Drawing Figures**

Fig. 1 is a diagram of a radio apparatus according to an embodiment of the present invention.

Fig. 2 is a diagram of an add-on radio recording device according to an embodiment of the present invention.

Fig. 3 is a schematic diagram of operation of a memory system according to an embodiment of the present invention.

Fig. 4 is a diagram of a television device according to an embodiment of the present invention.

Fig. 5 is a diagram of an add-on television recorder device according to an embodiment of the present invention.

### **Description of Preferred Embodiments**

Fig. 1 represents a first and relatively simple embodiment of the present invention. A radio 11, such as, but not limited to a car radio, receives radio broadcasts from an antenna 13, tunes a particular channel by well-known circuitry, and plays the tuned audio presentation over a set of speakers 15, which are typically stereo speakers. Radio 11 in this embodiment also comprises a cassette tape player 17 which may conventionally be used for playing audio tapes over the same speakers 15.

In this embodiment of the invention the tape player is also capable, by selection, of recording the tuned audio played over the speakers, or other tuned audio (the radio may be capable of tuning plural channels simultaneously). Moreover, in this invention, the tape device is capable of continuous loop recording, which may be done in any one of several ways. For example, a single tape may have multiple tracks, wherein one set of tracks may be dedicated to recording in one direction, and a second set for recording in an opposite direction. There may be moveable recording and playing heads, or redundant heads properly positioned. In an endless recording mode, when the tape reaches one end, it automatically reverses and records in the opposite direction. After such a tape is filled to capacity, continuing recording will overwrite the oldest stored data, analog or digital, and, properly controlled per the insight of the present invention, create the storage medium described above as needed. If, for example, the tape can hold one hour of recording in one direction, it can hold two hours in both directions, and the tape, constantly running while the radio plays, and

recording the output of the radio, will provide at any point in time a two hour repository backwards in time from the given present time.

In this embodiment the tape player may be used for playing conventional tapes, or a user may insert a blank (or a tape to be overwritten) and select a special mode by, for example, pressing a dedicated button on the radio control interface. In the special mode the tape continues to run and provide the special recording until the user has a need or desire to access the recorded data. The operation and switching from one mode to another may be managed by a dedicated processor in the device (not shown). The net effect is Rewind Radio, as the user may in effect rewind the audio presentation at any time to review or replay anything that the radio presented in the time period represented by the capacity of the recording device.

In some embodiments an input is provided for flagging. That is, a user may mark a position in the endless recording for later reference. For example, if the user recognizes a musical number or an interview or the like, playing over the speakers from the radio, that the user would like to retain, the user may, by a special input, such as a button or a voice command, cause a flag to be placed in the recording. Such a marking makes it easier for the user to later go to the position in the recorded material where the desired material is located.

In the embodiment with a single tape recording device, a user can remove the tape at any time and save it for future replay, and may simply plug a new tape into the tape recorder for continuing the circular recording process. The user may also take a tape from the device, insert it in a dual tape deck, and select a transfer desired material to a different tape.



In an alternative embodiment the radio has a second tape deck, and a user is enabled to select portions of a recorded tape and to transfer these portions to the second tape. In this embodiment a user may stop the circular recording mode, select the wanted portions, transfer those portions to the second tape, and then reenter the circular recording mode. In some situations it is not necessary to stop the tuned presentation while transfer to the second recording device is accomplished.

Fig. 2 represents another embodiment of the invention, wherein a radio 19 receives signals from an antenna 21, tunes a channel from the received signal by a tuner circuitry 25, amplifies the tuned signal by an amplifier 27, and plays the result over speakers 23. The conventional radio circuitry (tuner 25 and amp 27) are illustrated in a very broad manner, as such circuitry is notoriously well-known in the art.

In the embodiment illustrated in Fig. 2 a special circuitry 29 is added comprising an analog-to-digital converter (A/D) 31, a microprocessor 33 and a non-volatile digital memory 35 interconnected on a bus 37. Again, elements for such circuitry are well-known, and the apparatus is illustrated in a broad manner. The non-volatile digital memory can be any of several types available, including magnetic and optical devices. The tuned output of tuner 25 is provided to A/D 31 as shown, which puts the digital equivalent on bus 37. Microprocessor 33 manages the operation such that the digitized audio data is stored in memory unit 35.

Fig. 3 is a diagrammatic representation of memory 35, which may take any one of several forms, as described above, and is preferably what is known in the art as a Flash memory. Memory 35 is addressable word-by-word, as is most digital memory, beginning with a first word at address 41 and extending to a last word at address 43. Storage of the digitized audio

data is managed by microprocessor 33 to begin at word 41 (or in some cases at any other word) and to proceed always in one direction by sequential addresses in the direction of arrow set 39. It is well-known in the art that digital audio data is stored in sequentially addressed word sectors as shown.

5           One thing that is unique to the present invention is that the microprocessor is programmed to recognize the next word after last word 43 to be first word 41. The net result of the recording protocol, then, is a record of a fixed length of presentation up to the present time. That is, if 20 minutes of audio can be recorded in memory 35, at any point in time the  
10       memory will have recorded the last twenty minutes of the tuned presentation. If at any time the user stops the recording, he/she may rewind the memory to any time in the twenty minute window, and replay and review any of the recorded material.

          The result now is what the inventor terms Rewind Radio, because  
15       the operation simulates the operation of playing a prerecorded medium, wherein one may at any time rewind to replay any portion.

          The length of the widow available is, of course, determined by the size of the memory and the nature of the recording, which are adjustable (at least in the design process).

20           In preferred embodiments radio 19 of Fig. 2 has an operator input for engaging and disengaging the Rewind mode, wherein circular recording into memory 35 takes place. In some embodiments there is another input for flagging particular points in the memory, and a flag may be inserted automatically when one intentionally disengages the Rewind mode, and at  
25       other times as may be convenient. Such flagging of addresses facilitates finding particular points in a recording for review. There are many ways this may be done. Also, there is, in preferred embodiments, a Rewind input

for moving a pointer in the memory at which replay may begin. Such an input may be a jogging wheel, a spring-centered knob, or any of several other apparatus capable of performing the purpose. In a preferred operation there may be a jogging facility for moving the pointer from flag to flag in the memory.

In addition to the above-described controls, there is also a replay mode wherein selected data is read from memory, provided to converter 31, which in this case is both an A/D and a D/A converter, and played over speakers 23. When the replay mode is invoked, the normal radio function is aborted.

In another embodiment memory 35 is implemented on a removable flash memory, such as a PC card, with a docking slot, and a recording may be removed and used with another device for replay or other use.

In yet another embodiment there is a second digital memory 38, which is preferably a removable media device, such as a PC card (PCMCIA standard as known in the art), and controls are provided in the operator interface for selecting portions of material recorded in memory 35 and transferring those portions to memory 38, which may then be removed and used to transport the recorded material to another device, such as a portable or desktop PC, or a device capable of using the memory device and rendering the recorded material as audio again. This second memory device can be any kind of non-volatile removable memory, including magnetic and optical devices. In this manner a user can build a static recording of just those selections of programs he or she wishes to keep. Again, in some instances, it is not necessary to interrupt a tuned program to accomplish transfer of material from the circular to the second recording device.

In another embodiment of the present invention a Rewind TV

apparatus is provided. The operation and apparatus of this device may be described with references to Figs. 1 and 2, with the exception that the device is a TV apparatus instead of a radio, the antenna input represents input from any video data stream source, such a TV antenna or a TV cable, and the  
5 output is a TV display rather than speakers 23 shown.

The operation in the TV case is analogous to the Rewind Radio, in that the output of the tuner during operation of a Record mode is fed to both the display and the recording apparatus. In the recorder the video signal is fed to a non-volatile memory device in a circular fashion just as described  
10 for the Rewind Radio. The memory device can be a VCR (analogous to Fig. 1) or a digital memory (analogous to Fig. 2). There is an operator interface with inputs for at least starting and stopping the record mode, and initiating playback. There may also be jogging input for locating a preferred starting point in a record. In the TV case, playback may replace  
15 tuned play, or playback might be in a Pix-on-Pix window over the normal window, and so on. One may also in some embodiments tune the audio to either the tuned signal or to the playback data. In the TV case there is optionally a second memory, as described for the radio case, wherein one may transfer selected portions of material from the circular recording device  
20 to the second removable device, for the same purposes described relative to the Rewind Radio. This second device in some embodiments may be a writable CD-ROM or optical memory of another sort, as these kinds of memory have relatively high capacity. The result in this embodiment is a Rewind TV, where the last "x" minutes of any real-time presentation may  
25 be replayed.

In an alternative embodiment for TV, just the audio portion of the TV presentation may be recorded, which may be done for equal time frames

with much smaller memory. In this embodiment, one may rewind and save audio selections, such as music and interviews, from video presentations.

In yet another embodiment of the invention an add-on device 45 is provided for after-market use with conventional radios. In this case radio  
5 47 may or may not have a tape deck. Device 45 has a play-and-record tape deck 53 capable of endless recording under proper control of a microprocessor 51, as previously described with reference to Fig. 1. There is also an operator interface for at least engaging/disengaging the recording mode, and for playback, as well as a jogging input for finding a particular  
10 position in a recorded tape for playback.

For ease of installation and use in the this aftermarket embodiment, device 45 has a stereo input by which cables 49 from the radio may direct analog audio to device 45 rather than to the speakers, and device 45 also has a stereo output by which audio may be provided via cables 55 to the  
15 speakers. When device 45 is off or recording, the tuned audio signal feeds through device 45 to the speakers for real-time presentation without interruption, and when device 45 is in playback, the tuned signal is blocked, and the recorded signal is output to the speakers. Although not shown, there may additionally be various well-known elements operable in device 45,  
20 such as amplifiers and the like.

As described for the embodiment of Fig. 1, the add-on device of Fig. 4 may optionally have a second tape deck, and controls for such as marking portions of material for reference and transferring portions of material from one tape to the other.

25 Fig. 5 is a block diagram of an aftermarket device 59 wherein recording is done digitally in the manner of radio 19 of Fig. 2. As in the device of Fig. 4 input is by cables from the speaker output of an existing

radio, in this case radio 57. Converter 61 digitizes audio input, and puts the result on bus 67. Microprocessor 63 manages operations to record digital audio sequentially and circularly in memory 65 as described for memory 35 of Fig. 3. An input interface, not shown, allows for engaging and  
5 disengaging the recording and playback modes, and provides a jogging input for finding preferred places in a recording. Operation is analogous to that described for radio 19 of Fig. 2. During playback the tuned input is blocked and the recorded data is played to the speakers. There may be an amplifier and perhaps other elements, not shown, as may be necessary.

10 In addition, still referring to Fig. 5, there may optionally be a second digital memory 68, implemented as a removable module, such as a PC card, a hard disk, an optical memory, et al., allowing a user to transfer selected portions from circular memory 65. After such transfer the user may remove memory 68 to any other compatible device for further processing.

15 In yet another embodiment an aftermarket device is provided for use with existing television equipment, analogous to the radio aftermarket device of Fig. 4. In this embodiment the tape deck is a VCR device capable of endless recording, with redundant or movable heads, managed such that circular recording is accomplished as taught herein. In yet another  
20 embodiment an aftermarket device for existing TV apparatus is analogous to the apparatus illustrated with reference to Fig. 5, using a TV instead of a radio, the TV drawing a signal from any conventional source. The tuned signal is provided to the add-on device, which records the data stream digitally in a circular fashion as taught herein. In both of these add-on TV  
25 devices there may optionally be a second non-volatile memory unit, which may be any convenient sort, as described for the radio devices, allowing the user to transfer selected portions of recorded material from the circular

memory to a removable memory to be taken away and processed elsewhere. Also, in either TV device, the memory operations may be for audio only, as described above.

- It will be apparent to the skilled artisan that there are numerous
- 5 changes that may be made in embodiments described herein without departing from the spirit and scope of the invention. For example, there are many alterations in circuitry that might be made, there are many sorts of microprocessors that might be used, and there are many ways that software and firmware may be provided, accomplishing essentially the same results.
- 10 As such, the invention taught herein by specific examples is limited only by the claims below.

What is claimed is:

1. A radio apparatus comprising:

tuning circuitry for selecting a channel from an input rf spectrum;

5 an output for driving a speaker system with an audio presentation derived from the selected channel; and

a recording apparatus having a memory with capacity for recording a fixed time duration T of the audio presentation, and adapted to make an audio record sequentially in a circular fashion, such that when the memory capacity is filled, the device continues to record, overwriting the oldest recorded information, providing thereby, at any point in time, a stored copy of time duration T immediately preceding the point in time.

2. The radio apparatus of claim 1 wherein the recording apparatus comprises a tape recorder adapted to record in a circular fashion.

3. The radio apparatus of claim 1 further comprising an A/D converter, wherein the memory is a digital memory managed to record sequentially in a circular fashion, and the audio presentation is presented at the speakers and simultaneously digitized and recorded in the digital memory.

4. The radio apparatus of claim 1 further comprising user-operable inputs for interrupting circular recording, selecting beginning positions for playback, and playing back the recorded data.

5. An add-on recorder for a radio apparatus, comprising:




an input for receiving an analog audio signal stream from a radio;  
an output for driving a speaker system; and

a memory system with capacity for recording a fixed time duration T  
of received analog audio signals, and adapted to make an audio record in the  
5 memory sequentially in a circular fashion, such that when the memory  
capacity is filled, the system continues to record, overwriting the oldest  
recorded information, providing thereby, at any point in time, a stored copy  
of time duration T immediately preceding the point in time.

10 6. The add-on recorder of claim 5 wherein the memory system comprises a  
tape recorder adapted to record in a circular fashion.

7. The add-on recorder of claim 5 further comprising an A/D converter,  
wherein the memory system comprises a digital memory managed to record  
15 sequentially in a circular fashion, and the received analog audio signal  
stream is sent to the speaker system via the output and simultaneously  
digitized and recorded in the digital memory.

8. The add-on recorder of claim 5 further comprising user-operable inputs  
20 for interrupting circular recording, selecting beginning positions for  
playback, and playing back the recorded data.

9. A television apparatus comprising:  
25  tuning circuitry for selecting a channel from an input video  
spectrum;

an output for driving a television display with a video presentation  
derived from the selected channel; and

a recording apparatus having a memory with capacity for recording a fixed time duration T of the video presentation, and adapted to make a video record sequentially in a circular fashion, such that when the memory capacity is filled, the apparatus continues to record, overwriting the oldest recorded information, providing thereby, at any point in time, a stored copy of time duration T immediately preceding the point in time.

10. The television apparatus of claim 9 wherein the recording apparatus comprises a video tape recorder adapted to record in a circular fashion.

11. The television apparatus of claim 9 further comprising an A/D converter, wherein the memory is a digital memory managed to record sequentially in a circular fashion, and the video presentation is presented at the television display and simultaneously digitized and recorded in the digital memory.

12. The television apparatus of claim 9 further comprising user-operable inputs for interrupting circular recording, selecting beginning positions for playback, and playing back the recorded data.

13. An add-on recorder for a television apparatus, comprising:  
an input for receiving a video data stream;  
an output for driving a television display system; and  
a memory system with capacity for recording a fixed time duration T of the received video data stream, and adapted to make record in the memory sequentially in a circular fashion, such that when the memory capacity is filled, the system continues to record, overwriting the oldest

recorded information, providing thereby, at any point in time, a stored copy of time duration T immediately preceding the point in time.

14. The add-on recorder of claim 13 wherein the memory system comprises  
5 a video tape recorder adapted to record in a circular fashion.

15. The add-on recorder of claim 13 further comprising an A/D converter,  
wherein the memory system comprises a digital memory managed to record  
sequentially in a circular fashion, and the received video data stream is sent  
10 to the television display via the output and simultaneously digitized and  
recorded in the digital memory.

16. The add-on recorder of claim 13 further comprising user-operable inputs  
for interrupting circular recording, selecting beginning positions for  
15 playback, and playing back the recorded data.

### **Abstract of the Disclosure**

A radio or television apparatus has tuning circuitry for selecting a channel from an input spectrum, an output for presenting a presentation  
5 from a selected channel, a recording apparatus having a memory with capacity for recording a fixed time duration T of the selected presentation, and adapted to make an audio record sequentially in a circular fashion, such that when the memory capacity is filled, the device continues to record, overwriting the oldest recorded information, providing thereby, at any point  
10 in time, a stored copy of time duration T immediately preceding the point in time. This innovation provides limited rewind capability for real-time data streams. In alternative embodiments add-on devices are provided for existing radios and TVs.

FIG. 1 is a schematic diagram of a system 11.

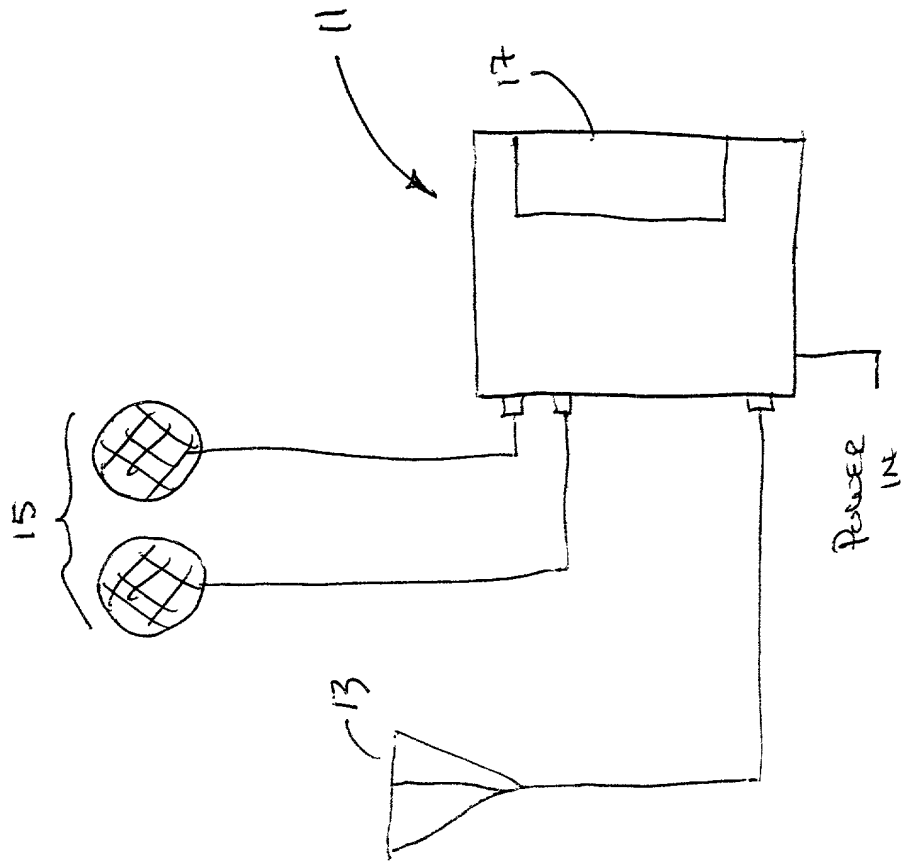


FIG. 1

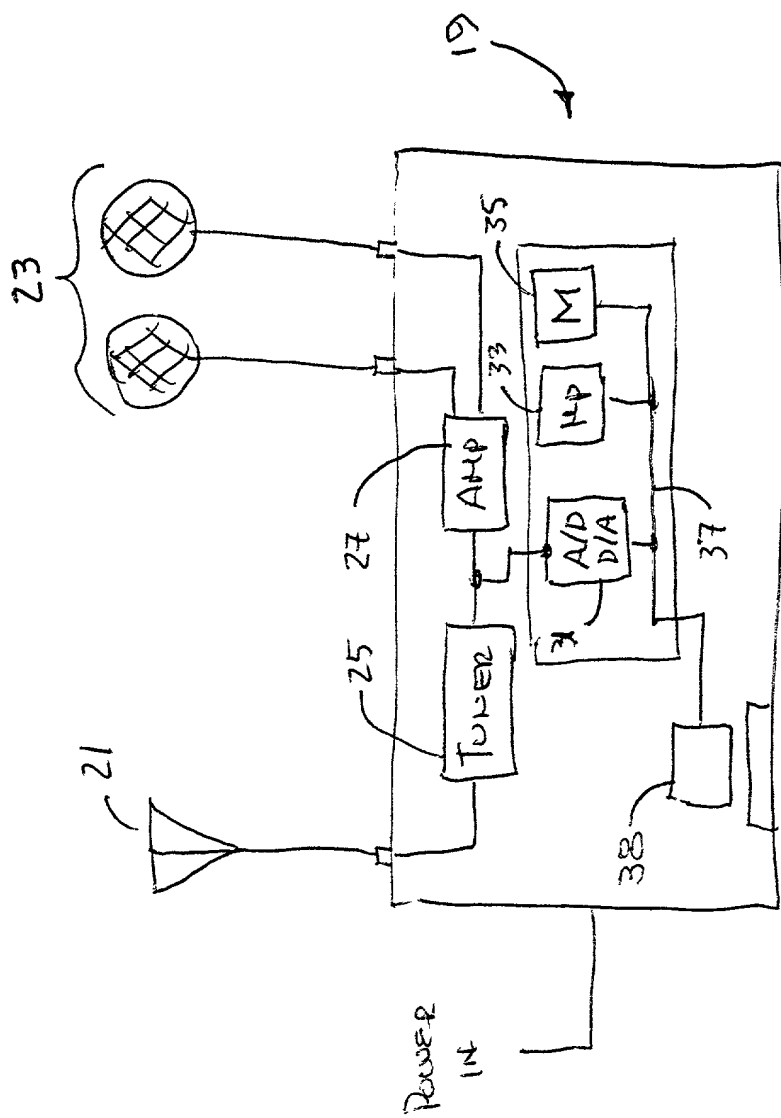


Fig. 2

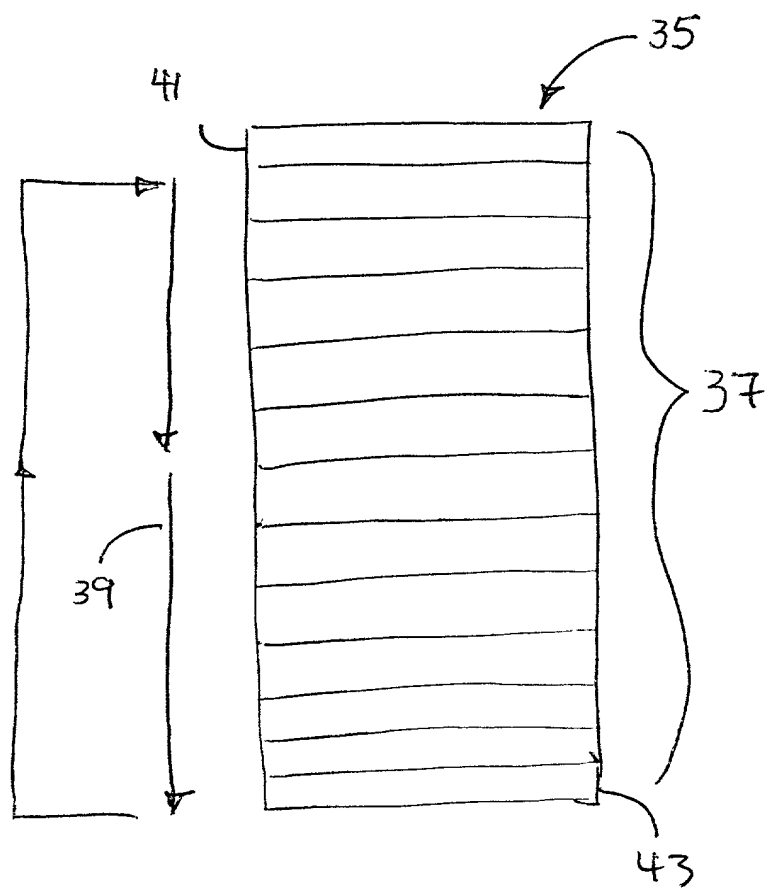


FIG. 3

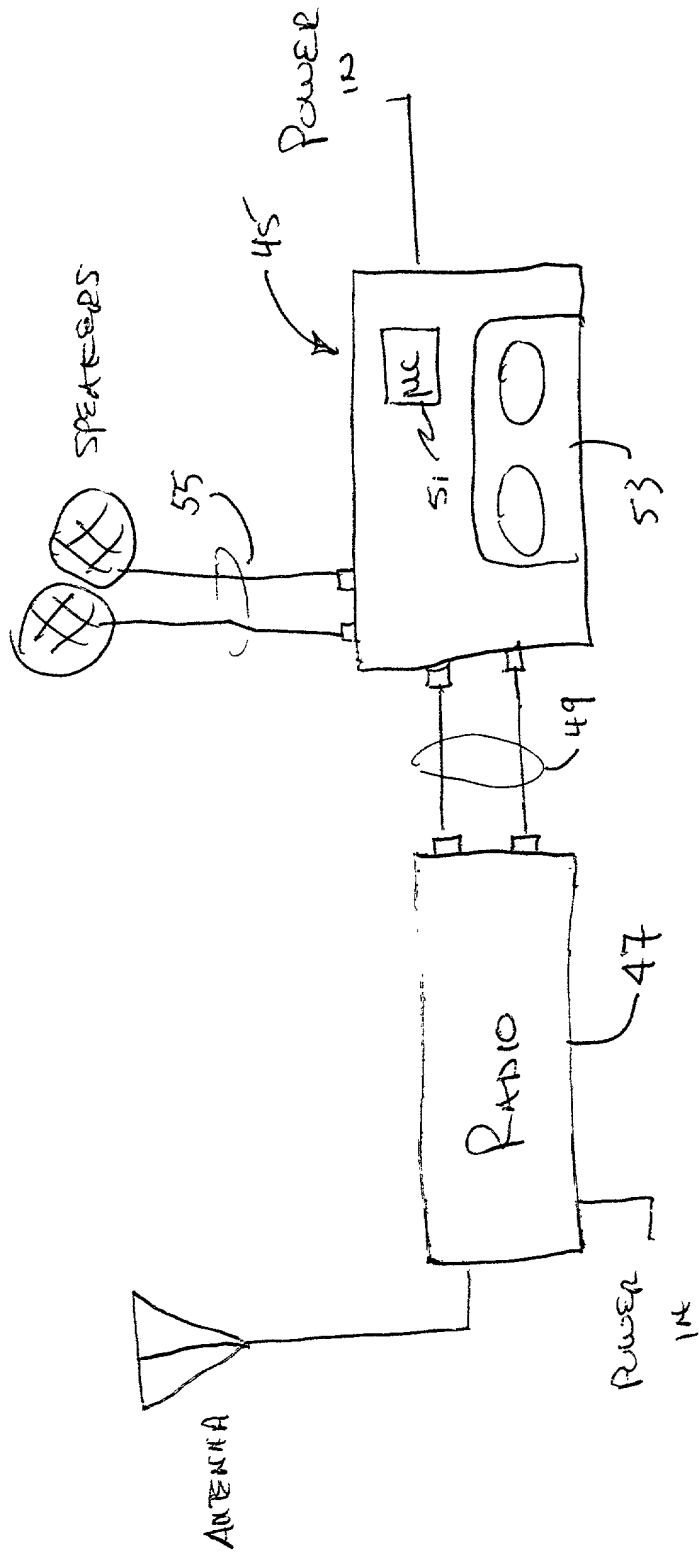


FIG. 4



FIG. 5 is a block diagram of a system for processing signals received from an antenna.

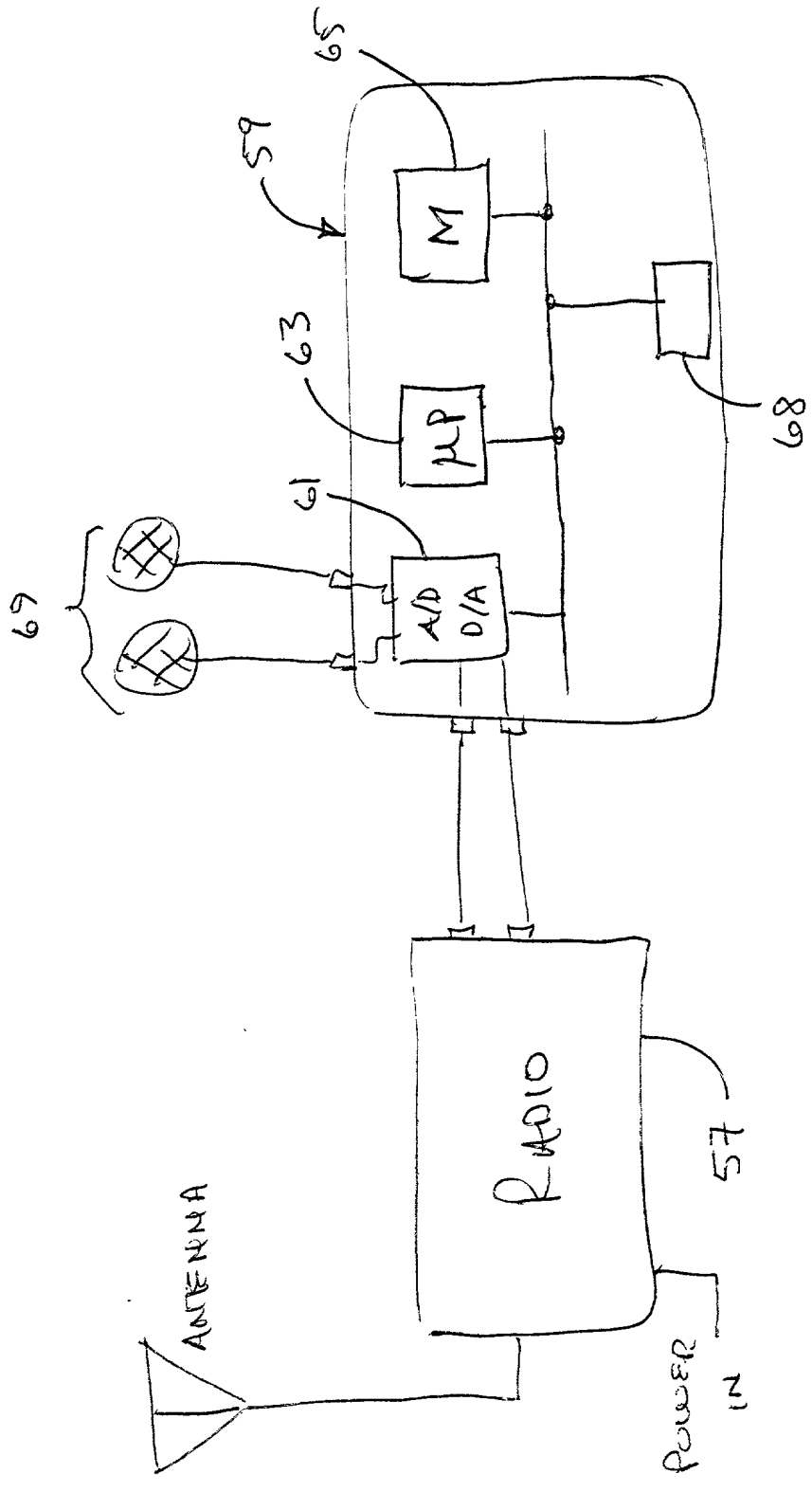


FIG. 5

**VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS  
(37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR**

Docket Number (Optional)  
P644

Applicant or Patentee: Mark A. Boys  
Serial or Patent No.: NA  
Filed or Issued: NA  
Title: Rewind Radio and Television

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

- ☒ the specification filed herewith with title as listed above.  
☐ the application identified above.  
☐ the patent identified above.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ No such person, concern, or organization exists.  
☐ Each such person, concern or organization is listed below.

Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

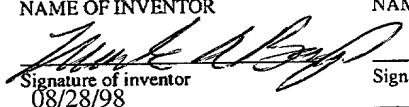
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Mark A. Boys

NAME OF INVENTOR

NAME OF INVENTOR

NAME OF INVENTOR

  
Signature of inventor

Signature of inventor

Signature of inventor

08/28/98

Date

Date

Date

# DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

ATTORNEY DOCKET NO. **P644**

As a below named inventor, I hereby declare that: My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **Rewind Radio and Television**

the specification of which (check one) ☒ is attached hereto.

- ☐ was filed on: \_\_\_\_\_  
☐ Application Serial No. \_\_\_\_\_  
☐ and was amended on \_\_\_\_\_  
(If applicable)

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, s 1.56 (a). In the case that the present application is a continuation-in-part application, I further acknowledge the duty to disclose material information as defined in 37 CFR s 1.56(a) which became available between the filing date of the prior application and the filing date of the present application. I hereby claim foreign priority benefits under Title 35, United States Code s119 of any foreign applications for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

(Number) (Country) (Day/Month/Year Filed)

(Number) (Country) (Day/Month/Year Filed)

I hereby claim the benefit under Title 35, United States Code, s120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, s112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, s156(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Serial No.): \_\_\_\_\_ (Filing Date): \_\_\_\_\_ (Status): \_\_\_\_\_  
(Application Serial No.): \_\_\_\_\_ (Filing Date): \_\_\_\_\_ (Status): \_\_\_\_\_  
(Application Serial No.): \_\_\_\_\_ (Filing Date): \_\_\_\_\_ (Status): \_\_\_\_\_  
(Application Serial No.): \_\_\_\_\_ (Filing Date): \_\_\_\_\_ (Status): \_\_\_\_\_  
(Application Serial No.): \_\_\_\_\_ (Filing Date): \_\_\_\_\_ (Status): \_\_\_\_\_

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.  
(List name and registration number)

Name: Donald R. Boys


Reg. No. 35,074

SEND CORRESPONDENCE TO:  
Donald R. Boys  
P.O. Box 187  
Aromas, CA 95004

DIRECT TELEPHONE CALLS TO:  
Donald R. Boys (408) 726-1457

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: Mark A. Boys

1st inventor's signature:  Dated: 08/28/98  
Residence: 7121 West Zayante Road, Felton, CA., 95018 Citizenship: US  
Post Office Address: Same

Full name of 2nd joint inventor, if any: \_\_\_\_\_

2nd inventor's signature: \_\_\_\_\_ Dated: \_\_\_\_\_  
Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_  
Post Office Address: \_\_\_\_\_

Full name of 3rd joint inventor, if any: \_\_\_\_\_

3rd inventor's signature: \_\_\_\_\_ Dated: \_\_\_\_\_  
Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_  
Post Office Address: \_\_\_\_\_

Full name of 4th joint inventor, if any: \_\_\_\_\_

4th inventor's signature: \_\_\_\_\_ Dated: \_\_\_\_\_  
Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_  
Post Office Address: \_\_\_\_\_

Full name of 5th joint inventor, if any: \_\_\_\_\_

5th inventor's signature: \_\_\_\_\_ Dated: \_\_\_\_\_  
Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_  
Post Office Address: \_\_\_\_\_

Full name of 6th joint inventor, if any: \_\_\_\_\_

6th inventor's signature: \_\_\_\_\_ Dated: \_\_\_\_\_  
Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_  
Post Office Address: \_\_\_\_\_

Full name of 7th joint inventor, if any: \_\_\_\_\_

7th inventor's signature: \_\_\_\_\_ Dated: \_\_\_\_\_  
Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_  
Post Office Address: \_\_\_\_\_

Full name of 8th joint inventor, if any: \_\_\_\_\_

8th inventor's signature: \_\_\_\_\_ Dated: \_\_\_\_\_  
Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_  
Post Office Address: \_\_\_\_\_